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PO Box 117
221 00 Lund
+46 46-222 00 00

RESEARCH ARTICLE



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Resourcification: A non-essentialist theory of resources for sustainable development

Hervé Corvellec¹ | Johan Hultman¹ | Anne Jerneck² | Susanne Arvidsson³ | Johan Ekroos⁴ | Niklas Wahlberg⁵ | Timothy W. Luke⁶

¹Department of Service Studies, Lund University, Lund, Sweden

²Lund University Centre for Sustainability Studies (LUCSUS), Lund University, Lund, Sweden

³Department of Business Administration, Lund University, Lund, Sweden

⁴Centre for Environmental and Climate Research, Lund University, Lund, Sweden

⁵Department of Biology, Lund University, Lund, Sweden

⁶Department of Political Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

Correspondence

Hervé Corvellec, Department of Service Studies, Lund University, Lund, Sweden.
Email: herve.corvellec@ism.lu.se

Abstract

Overuse of resources is accelerating current negative trends in climate change, ecosystem destruction, and biodiversity loss. The ultimate outcome is that contemporary human society is reaching or exceeding the limits of planetary boundaries. It is therefore imperative to articulate a new theoretical understanding of resources and the ethical, political, and environmental conditions of their use. In this article, we take a radical departure from treating resources as having fixed, essential and ready to exploit qualities, and offer a non-essentialist theory that considers that resources come into being as a result of social processes. We label this approach *resourcification*. This shift offers a new theoretical platform for developing a post-sustainability understanding of the relationships of humans to humans, to other living creatures, and to the physical environment, one that is more suited to meeting the challenges of working with the sustainable development goals in the Anthropocene.

KEYWORDS

Anthropocene, genes, labor, resources, resourcification, waste

1 | INTRODUCTION

In a world comprising nearly 10 billion people, competition for the resources required to develop the material wealth to sustain acceptable living conditions will only accelerate. In response to this increasing competition, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, an interconnected set of 17 sustainable development goals (SDGs) that come with a pledge:

to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources, and taking urgent action on climate change, so that it can support the needs of the present and future generations (United Nations, 2015, p. 2).

Yet, we assert that little progress can be made in meeting the SDGs without confronting in theory and practice how increasing amounts of tangible natural materials such as minerals, oil, and timber, as well as intangible immaterial assets such as emotions, culture, and knowledge, come to be identified as readied for and turned into resources. We call this process *resourcification* (see Luke, 2002) to make clear that things are not turned into a resource simply because they are exploitable and close at hand. Many social conditions have to be fulfilled before things become effectively exploitable, for example, the availability of capital, technology, and social acceptance. Resourcification as a concept provides a framework for understanding why, how, where, when, and for whom the social processes of resource mobilization unfold.

Resourcification makes clear that resources are not simply already here but are the outcome of social processes that condition what is

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considered a resource. Resourcification affords the theoretical and practical means to shift attention away from naïve essentialist claims about some intrinsic attractive quality in resources as such, to a focus on concrete explication of the social processes whereby things are made ready for conceptualization, extraction, and utilization as different types of resources (e.g., Moya-Clemente, Ribes-Giner, & Pantoja-Díaz, 2020). This can be contrasted with the objectivist understanding of resources inherited from the paradigmatic engineering practices of 18th-century German scientific forestry (Scott, 1998, chap. 1) that defines resources as existing *per se*, independent of the specific social contexts, conditions, and practices needed to locate, extract, and utilize them. Such an objectivist view is problematic as it neglects considering; first, the processes of how resources come into being with potential utilities and actual values and second, the cultural, economic, and technical consequences of these imaginative and extractive processes. Resource economist Erich Zimmermann (1951 [1933]) was the first to address this problem by reframing resources in the dynamic category of “becoming” rather than the static conditions of “being.” He introduced a shift from an objectivist universal sense of resource utility to a non-essentialist approach in which resources must first be discovered or imagined to have specific valuable qualities that can be variably, intentionally, and purposefully produced in different time and space conditions of use (Bakker & Bridge, 2006). Resourcification then begins to express “a cultural category into which societies place those components of the non-human world that are considered to be useful or valuable in some way” (Bridge, 2009, p. 1219) in a more relational paradigm that emphasizes complexly entangled process thinking, because “mainstream approaches to sustainability currently fall mainly within a technocratic paradigm, focused on addressing certain elements of the system without addressing the intrinsic relations between those elements” (Walsh, Böhme, & Wamsler, 2021, p. 74).

There is a codetermining dynamic between resourcification processes and SDG achievements. On the one hand, the SDGs create conditions of purposefulness that enable people to start turning things into resources, for example, when the need for climate action serves to convince politicians and households that a separate collection of organic waste in Sweden is an example of sustainable waste management (Corvellec, 2016). On the other hand, resourcification processes, even if only liminal, strengthen the legitimacy and relevance of the SDGs by supporting the claim that they are achievable, for example, when waste-to-energy technologies are promoted as a potential resource to improve health, provide clean energy, and contribute to the urban sustainability of Kathmandu, Nepal (Lohani, Keitsch, Shakya, & Fulford, 2021). The SDGs help turn things into resources and turning things into resources contributes to reaching the SDGs.

It is in this spirit of a concern for how resources become that we suggest turning to resourcification, a non-essentialist theory of resources, in order to generate fresh inquiries about the pursuit of the people, planet, prosperity, peace, and partnership goals (Tremblay, Fortier, Boucher, Riffon, & Villeneuve, 2020) of the SDGs and Agenda 2030. In particular, because such a shift paves the way for scrutiny of the self-interested public and corporate strategies of resource

exploitation, a resourcification approach could prevent the sustainable development that lies at the core of the SDGs from being neither sustainable nor developmental (Luke, 2005).

2 | KEY COMPONENTS OF RESOURCIFICATION

Resourcification is a multidimensional social process that entails the following: a thorough understanding of the social-material processes associated with the current growing resource crisis; a theoretical knowledge of what it means to transform or translate something into a resource; and a provisional set of concepts to serve as the theoretical framework for engaging in critical and systematic research into resourcification, guided by an interdisciplinary agenda and ethical awareness. A way to structure this multidimensionality is to analytically distinguish between contexts, conditions, modes, and temporalities (Hultman et al., 2021; see Figure 1).

2.1 | Contexts

Resourcification occurs within the *contexts* of both time and space and has distributive effects (Hayter & Patchell, 2015). An agent identifies a potential value in a latent or liminal resource, deems which end product it can become together with which needs it may fulfill, and then proposes ways to create a demand for it (De Gregori, 1987). Resourcification processes unfold in multiple locations purposefully linked through the mobility of resources and control over resourcification infrastructures. All of these elements are distributed in time and space in ways that both capture and contain the dynamic uses and values of resourcification. The unequal spatial repartition of wealth and environmental pressures points to the need to systematically put the global resourcification of nature for developmental purposes in specific spatial and temporal perspectives (e.g., Erdoğan et al., 2021; Luukkanen et al., 2019).

Resourcification analysis, then, reveals the systemic asymmetries of unequal resource access, utilization, and control (Martinez-Alier, 2018). Consequently, resourcification is both for someone as well as not for others. The multiversal potentialities of becoming resourcified, then, always prioritize particular interests and give limited prominence to certain perspectives to the exclusion of others. Hence, resourcification is consciously contextualized along cultural, national, regional, organizational, or other institutionalized borders of territory, power, labor, knowledge, and/or acumen (Burchardt & Dietz, 2014). For instance, if framed by a nation state, resourcification will most likely fuel a nation-centric vision of such resource exploitation (Bridge, 2013). Among resource owners, resource nationalism usually prompts protectionist practices to safeguard the becoming of resources (Koch & Perreault, 2019), whereas among prospectors, it may prompt secretive personal designs for individual enrichment or trigger collectively aggressive neo-colonial resource-grabbing (Martinez-Alier, 2018). Likewise, acknowledging the differences in the

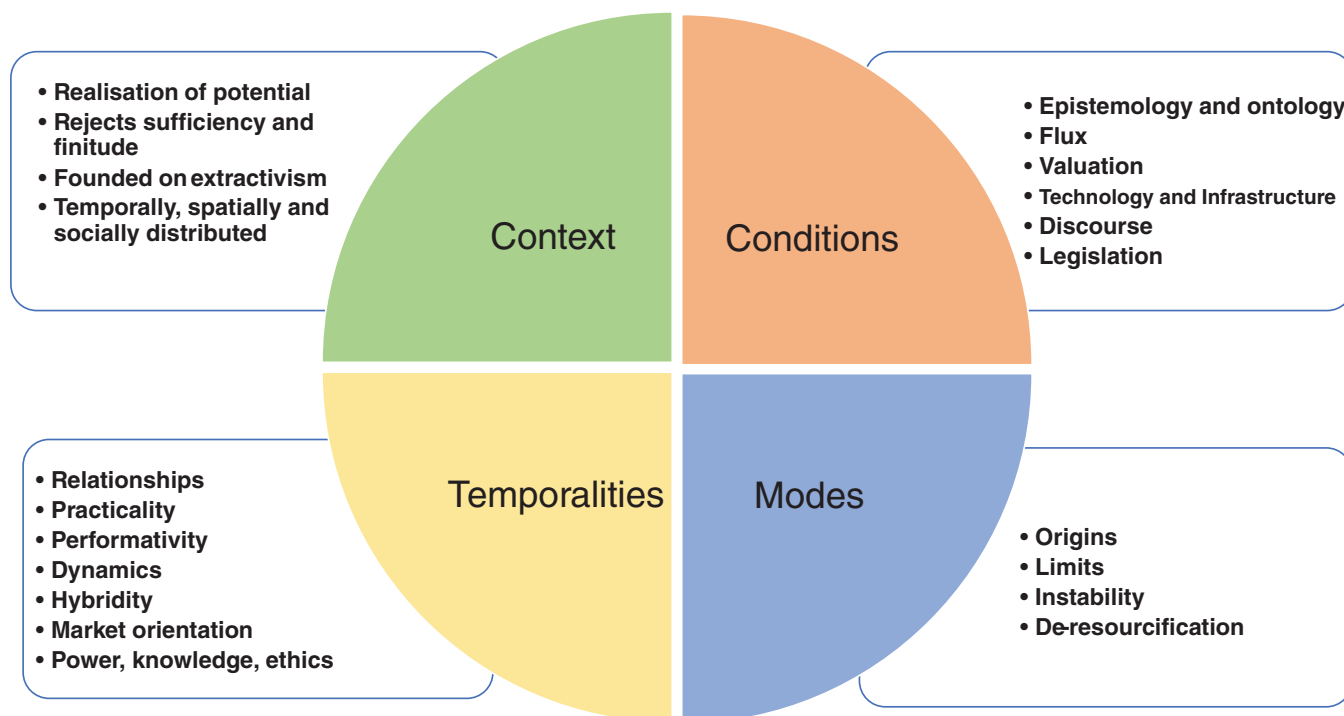


FIGURE 1 Dimensions of resourcification [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

developmental needs of men and women (Nhamo, Muchuru, & Nhamo, 2018) will prompt different resourcification priorities.

2.2 | Conditions

Resourcification processes are characterized by a broad range of *conditions* that pertain to knowledge (Zimmermann, 1951 [1933]) and technology. The origin of a process may spring from a crisis, a situation of scarcity, failing discursive power, or from a situation of abundance or oversupply. The boundless resourcification that led up to the Anthropocene, grounded in anthropocentrism and extractivism, has taken place without consideration of whether natural or non-natural resources are renewable or nonrenewable (e.g., Erdoğan et al., 2021). This has resulted in both potential and actual transgressions of the planet's boundaries (Rockstrom et al., 2009; Steffen et al., 2015). A growth-centered understanding of development (Hickel, 2019) has fueled resourcification that takes natural entities and processes, humans and human-made environments as a given, and intentionally calculates how to mobilize their potential energies, materials, or services continuously in order to satisfy human needs or demands. In particular, it rests on an entrepreneurial, managerial, or technical imaginary of nature, which always frames it as an accessible, cheap, and ready-to-resourcify stock of inputs, waiting to be exploited with inputs of capital, entrepreneurship, and technology (Moore, 2016). In contradistinction, a critical awareness of the downside of such an imaginary calls for a move beyond business as usual (Scheyvens, Banks, & Hughes, 2016) in order to reach the SDGs.

Also, resourcification is always constrained by the practical possibility of extracting any potential resource from its current setting and transporting it elsewhere for further exploitation and use (Luke, 1995, 2001). Thus, a latent resource must be inserted into some regime of norms and values embedded in existing institutionalized activities and valuation practices (Appadurai, 1986). This process must meet the conditions of support from the available discourses, infrastructures, legislation, and technology at play in its contexts of discovery, transformation, and use. In order to succeed, resourcification has to be continually reproduced and buffered by flexible supportive arguments (Richardson & Weszkalnys, 2014) mediated by relational process thinking (Whitehead, Griffin, & Sherburne, 1978 [1929]).

2.3 | Modes

In order to study the dynamics of a resourcifying agent's interactions with the environment, its materials, and artifacts, it is necessary to distinguish between the various *modes* of resourcification. Resourcification is usually pragmatic because it must build on what already exists in terms of available biotic entities, tangible materials, and intangibles factors, such as aesthetics and culture. Uncompromised access is pivotal (Dewulf et al., 2021), for example, to sites of anthropogenic resources such as old landfills, buildings, as well as stocks of accumulated goods (Winterstetter et al., 2021).

From conventional perspectives, resources are ordinarily understood as things that are waiting to be extracted, valorized and commodified. The typical developmental process follows this sequence: abstraction, commodification, monetization, marketization,

and financialization (Gómez-Baggethun & Ruiz-Pérez, 2011; Silvertown, 2015). This sequence of economization is then strengthened by the ways in which discursive practices frame a potential resource as economically viable; how property rights enable private appropriation, occupation, control, protection, and privilege; how monetization translates use value into exchange value; and how commercialization introduces the resource into commercial circuits of extractive production and collective use.

Management of the process is the visible hand of resourcification in play at every stage (Barney, 1991), with sustainable entrepreneurship being understood as a unique capacity to transform terrestrial ecosystems (Moya-Clemente et al., 2020) into sustainable competitive advantages (Hart, 1995; Iqbal & Ahmad, 2021). Thus, knowing how to manage resourcification is a developmental resource in itself: it stimulates further expansion of expertise understood as the why knowledge of science; the how to knowledge of craft, technique, and proven experience; the where, when, by, and for whom knowledge of politics; and a spiritual aesthetic from a knowledge of art, literature, music, religion, and metaphysics. The nexus of resource, energy, education, and sustainability is a case in point (Zafar, Saeed, Zaidi, & Waheed, 2021).

However, an emphasis on economization tends to downplay the ethics and power involved in resourcification processes, rendering them either invisible or naturalized and thus depoliticized (Huber, 2016, 2018). Resourcification presupposes that a liminal resource can be made amenable to economic, political, and technological utilization, and control. This is the core of the politics of resourcification: the power dynamics that strengthen certain agents and interests, while weakening others (Luke, 2001). More precisely, it distributes and redistributes benefits, incomes and privileges, as well as costs, inequalities and inconveniences. Hence, resourcification will inevitably generate competition and conflicts about developmental goals and priorities (e.g., Lowery, Dagevos, Chuenpagdee, & Vodden, 2020).

Resourcification is performative (Corvellec, 2016) in the sense that already the act of calling something a resource is making it relevant and legitimate for exploitation. Thus, the politics of resourcification for sustainable development raises ethical questions about who is entitled to what and why in order to advance whose purposes and in what ways (Jostad, McAvoy, & McDonald, 1996; Næss, 1989). Thus, the moral character of resourcification outcomes depends on how ethical principles, for example, distributive, environmental, and intergenerational justice, are enacted.

2.4 | Temporalities

Resourcification processes are characterized by differentiated *temporalities*. While developmental resourcification occurs in the present, it carries aspects from any past resourcification and gambles on potential future entrepreneurship (e.g., Moya-Clemente et al., 2020), growth (e.g., Hickel, 2019) and wealth (e.g., Luukkanen et al., 2019), but also challenges (e.g., Ramos, Caeiro, Moreno Pires, & Videira, 2018) and

policies (e.g., Tremblay et al., 2020). However, like development, resourcification is an unstable process, taking place at varying speeds. These practicalities make it difficult to estimate and evaluate all the positive, negative, or neutral outcomes of its effects. Resourcification may cease if resourcifying agents lack the capacity to maintain the legitimacy of this specific instance of resourcification. It can turn into a curse, leaving social, political, or economic damage and environmental disaster in its wake (Sachs & Warner, 2001; Tian, Gao, Liu, & Xu, 2020). Logic tells us that if something can be resourcified, it can also be de-resourcified as a result of changes in context, conditions, modes, and temporalities (Braudel, 1992). Hence, the same thing might very well be resourcified, synchronically and diachronically, in multiple places and for different reasons.

3 | ILLUSTRATING RESOURCIFICATION

Three cases can serve to illustrate how approaching resources in terms of the outcome of resourcification processes that are situated in time and place, and, among other things, embedded in technology, world view, policy, and relations of power, provides a renewed understanding of the challenges of the SDGs, and why these might or might not be met. These cases are genes, labor, and waste.

3.1 | Genes

How and when do individual genes become a resource, for what purposes can they be used, and what are the international norms and rules that regulate their resourcification? Research on transgenic technology started in the United States in the 1980s and soon triggered increasing interest in the patent industry. Before the 2010s, genetic resources were seen as the expressed phenotypes of domestic plants and animals. However, innovations in gene technologies (e.g., CRISPR/CAS9) radically changed the views on genes, with individual genes now being regarded as potential resources. Their potential applications range from developing medical cures, methods for speeding up plant and animal breeding processes, or paths for engineering bacteria to methods for binding CO₂ for climate change mitigation. The intentional act of seeing genes as lucrative resources in and of themselves is pervasive. This reality forms the basis of the search for the “specific gene” to cure cancer or determine a variety of human traits, including sexual orientation, criminal behavior, or specific genetic disorders. Although we understand that many, if not most, traits are controlled by more than a single gene, and that there is a complex interaction between genetics and the environment, powerful agents and societal interests have made significant advancements in using gene technology and individual genes to improve food and other resources, with a growing search for genetic material globally to secure inputs for industry and other economic activities as a result. This resourcification of genes even re-draws borders set on old colonial drawing boards to pave the way for new frontiers of cheap nature.

Harnessing the resource potential of genes serves SDG 3—good health and well-being; SDG 9—industry, innovation, and infrastructure; and SDG 2—zero hunger. Accelerating technological advancements combined with the fear that best-resourced countries and companies will exploit the genetic resources of the most biodiverse parts of the planet have caused concern for a global political framework to regulate the extraction and use of genes. This concern is manifested in the Nagoya Protocol from 2014 based on the Convention of Biological Diversity [CBD] from 1992. It states that access to the genetic resources of wild species and the benefits derived from them must be negotiated with the country of origin according to mutually agreed terms of use. Although few genes thus far have been commodified or fully marketized, the field is already characterized by fierce competition, which has triggered tensions between countries. When access to genes becomes dependent on financial power, while also being embedded in bureaucracies, this increases the conflict between basic research and commodification.

As gene technology may breach another gap in the human-environmental divide, we expect that the resourcification of genes—as it evolves from liminality to actuality—will become a highly politicized sustainable development issue, affecting the distribution and redistribution of wealth along lines of nations, class, race, and gender. This draws attention to the issues related to biosecurity, control over bodies, the conditions behind the mobility of information and access to biological material, and—ultimately—to the ownership as well as the marketization and commodification of nature.

3.2 | Labor

Postwar economic growth has demonstrated that an abundance of human capital in one sector spills over to match the scarcity of human capital in another sector. When mechanization de-resourcified agricultural labor, this drove an increasing number of workers into industry. With Taylorism, later reinforced by Fordism, the optimization of time and space became a recurring theme in the management and resourcification of labor. Then, driven by an accumulation of capital and technological change, the robotization of production and transportation continued to drive labor out of industry, replacing it with capital and fossil fuels. After that, digitalization has continued to de-resourcify industrial labor to the benefit of a rapidly growing service economy. As the latest expression of servicification, the gig economy, with its growing precariat working on call in extremely elastic conditions, reveals the ragged downsides of the resourcification of labor. In the current global economy, flexibility and fluidity are manifest in the increasing informalization, subcontracting, and outsourcing of work. Here, Marxist economists remind us that capitalism depends on a surplus of flexible workers to exploit resources and ensure a profit.

Labor is valued differently over time and space. The repeated elevation of labor as a duty discursively supports its resourcification. When a neoliberal economic regime changes the forms of labor and profoundly challenges what it means to be an employer or employee, this reveals that not all types of labor offer a secure path for

self-realization. By promoting technological change, altering social conditions, and changing legal institutions pertaining to labor markets, political regimes help employers gain greater discursive and material power to pursue their profits. When labor markets are deregulated, employers often take the opportunity to redefine the norms, rules, and values that shape labor relations. This is evident in the asymmetries of the service economy in which employers pass risks and responsibilities on to their employees, who may have to provide their own means of production, such as vehicles, computers, and workspaces. And when employers deny their employees secure contracts and safe working conditions, the employees must bear the cost of insurance and pension schemes. These modes of resourcifying labor redistribute the costs, risks, and inconveniences to workers in order to provide greater benefits to employers. The failure to transform labor into a resource in proper and just ways would be decisive for all the SDGs, in particular, SDG 8—decent work and economic growth, SDG 10—reduced inequality, SDG 5—gender equality, and SDG 1—no poverty together with SDG 2—zero hunger.

3.3 | Waste

Waste is conventionally regarded as having zero or even negative value, because most waste producers, including households, must pay to discard it. Yet, turning waste into a resource has a clear impact on SDG 12—responsible consumption and production and SDG 11—sustainable cities and communities, as well as SDG 13—climate action, SDG 14—life below water, and SDG 15—life on land.

In EU legislation, waste is defined as “any substance or object that the holder discards, intends to discard or is required to discard” (The European Parliament and the Council of the European Union, 2008/98/EC, article 3, sect. 1). However, these conditions vary according to jurisdiction, particularly globally, and many actors are petitioning for waste to be considered as both a liminal and an actual resource. Yet, the resourcification of waste can be challenging. How much waste is available, in terms of qualitative and quantitative volume? Who will determine the incentives to resourcify it? Why, how, and when? And which individuals, households, and collectives are assigned the legal responsibility, economic benefit, or ethical obligation to implement the conditions and modes for achieving this? The global waste crisis is evident in the vast plastic garbage patch in the oceans, and the huge emissions of greenhouse gases into the atmosphere. Such volumes of destructive industrial waste in the global environment have led to a growing awareness among political and corporate leaders that the full spectrum of economic costs and benefits in the existing economic system, particularly with regard to waste, must be reconceptualized in order to be compatible with the earth's planetary boundaries.

Also, there are increased concerns in the European Union to preserve political independence by securing supplies of critical materials, such as rare earth metals, through repeated recycling and domestic mining. This reframing means that huge volumes of waste sent to landfills or dumped into the sea must—and can—be drastically reduced.

When waste becomes a potential resource rather than a residue of inefficiency, it presupposes that these material flows can be redirected from single to multiple uses, for example, via repair, secondary use, or recycling and take-back systems in a circular economy. Such redirection of flows gives waste a renewed economic and environmental value, provided that resource recovery technology and infrastructures are available, for example, extracting phosphorus from sludge or recovering cotton fibers from used garments. In this context, legal provisions to regulate the design of the production, circulation, consumption, and accumulation of any commodity are both required to facilitate the resourcification of waste and a necessary condition to support the discursive, material, and infrastructural shift from discards to resources in waste flows.

Human scavengers on open-sky landfills, yet another example of a growing and exposed precariat, epitomize how waste is transformed into resources. Their close, dangerous and often unhealthy interaction with discards demonstrate how resourcification presupposes that some people have the ability and willingness to build ties with waste after other people have severed their ties to it. On an industrial scale, waste companies transform waste into value by drawing on their knowledge of how to orientate waste flows toward other uses, such as energy or new markets, including secondary materials, or via new methods such as second-hand distribution channels.

The temporalities of waste originate in consumption and, paradoxically, one main incentive to resourcify waste is to stimulate current and future consumption by securing more waste for profitable recycling. There are limits to this kind of resourcification of waste. For example, the aging, contamination, or degradation of recycled waste materials. For the time being, however, turning waste into resources is a key strategy for addressing the issue of waste and the future of economic growth in circular economies.

4 | WHY A NON-ESSENTIALIST THEORY OF RESOURCES?

First, these three cases demonstrate the importance of appraising resources in relational terms that emphasize their occurrence over time, in particular, as societal, developmental challenges evolve (Ramos et al., 2018), rather than as stable, synchronic inventories. Be(com)ing a resource is something dynamic rather than static; hence, methodologies aimed at explaining how things become resources need to be processual. For example, explaining how, when, and why some things become resources for a sustainable development will entail explaining why other alternative potential resources have not been resourcified, or why something that has long been considered a resource no longer will be treated as one. Such processual methodologies can best capture the relational where, when, and why of how sustainable resources become.

Second, the cases illustrate the need to fully understand the becoming of resources to give a more prominent role to the social sciences and humanities, for example, history to account for temporality; geography to account for the spatiality of resourcification unfolding in

specific times and places; economics and management to account for resourcification's market dimension; sociology for how resourcification creates and disrupts social relations; political science for its institutionalized power relations in policies. Interdisciplinarity encourages a relational articulation of narratives capable of integrating this range of theoretical diversity in action-relevant forms, for example, to garner rich support for proposed developments, influence public understanding, and mobilize stakeholders (Lowery et al., 2020). Such a multipronged approach is needed for sensing, observing, and analyzing the accelerating changes behind the social organization of resource becoming, and the societal-environmental dynamics involved in the transgression of planetary boundaries, which must be linked together in our understanding for the attainment of the SDGs.

Third, resourcification requires greater focus from ethics on these research questions and public policies. This is particularly important when considering resourcification frontiers, for example, the expanding boundaries of genetic engineering and the techno-commercial entanglements of rapidly growing bio-economies; the precarious working conditions in the growing recycling and service economies; the material geography of the circular economy; self-sufficiency principles in energy production and rare earth metals extraction; the extra-planetary colonization and extractivist planning; the rapidly expanding interests in and control of artificial intelligence; or geo-engineering as a means to mitigate the greenhouse effect and manage climate change. There is plainly an urgent need for an ethics of resourcification in all its manifestations, possibly toward a more ecocentric and less anthropocentric (Imran, Alam, & Beaumont, 2014) understanding of development.

Finally, resourcification analysis is inherently critical without sacrificing its potential for problem solving. It reveals institutional knowledge-power geographies, materialities, and affordances; how these are expressed; and how they are used to initiate and foster resourcifying practices and to buffer, protect and reproduce it. The mapping of agency and asymmetric relations in resourcification and de-resourcification processes becomes paramount. Indeed, relations in resourcification and de-resourcification processes call for inquiries into how "the stakes" are articulated and distributed between stakeholders across time and space, which is at the crux of Agenda 2030. Consequently, the processual focus on resourcification unites research and policy as politics. Resourcification thinking has the potential to become a normative vector for comprehending the varying costs and benefits of goods and services to sustainable development by anchoring a global, democratic, and transgenerational politics for reimagining resourcification. Such conceptual and institutional operations are necessary for systematic comparisons to be made between actual and potential resource-use trajectories, within and across spatial scales and generations. Not only is resourcification important for a deeper understanding of how, why, and for whom resources are made ready for use, value, and control. These concerns are also critical for leveraging synergies and minimizing trade-offs between SDGs when one type of resourcification or de-resourcification is in conflict with another.

The accelerating resource crisis calls for turning away from the established paradigms for monitoring sustainability as an aspired,

stable state of societal–environmental interactions. As a non-essentialist theory of natural and human resources, resourcification advances a more relational post-sustainability conceptual design better suited to meeting the SDGs of Agenda 2030, or why policies, organizations, and people may fail to do so. An increasingly anthropogenic planet under conditions of accelerating climate change and biodiversity loss not only entails acknowledging the typically invisibilized geobiophysical materiality and dynamics of SDGs, but also accentuating the fluidity and dissolving boundaries of societal–environmental interfaces behind these environmental degradation trends. It is hard at this time to envision future stable societal–environmental states, with SDGs appearing as moving targets in need of permanent efforts in order to be reached and maintained.

Resourcification, because it provides a dynamic understanding of the making and unmaking of resources, provides a theoretical preparation for an earth shaken by even more frequent and violent anthropogenic flux. We believe that a non-essentialist theory of resources has immense potential to help prepare living conditions in the 21st century that are more fair, inclusive, relevant, and sustainable.

ORCID

Hervé Corvellec  <https://orcid.org/0000-0001-7491-8816>

Susanne Arvidsson  <https://orcid.org/0000-0001-8609-9862>

REFERENCES

- Appadurai, A. (1986). *The social life of things: Commodities in cultural perspective*. Cambridge, England: Cambridge University Press.
- Bakker, K., & Bridge, G. (2006). Material worlds? Resource geographies and the 'matter of nature'. *Progress in Human Geography*, 30(1), 5–27.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Braudel, F. (1992). *Civilization and capitalism: 15th–18th century*, Vol. 2: *The wheels of commerce*. Berkeley, CA: University of California Press.
- Bridge, G. (2009). Material worlds: Natural resources, resource geography and the material economy. *Geography Compass*, 3(3), 1217–1244.
- Bridge, G. (2013). Resource geographies II: The resource-state nexus. *Progress in Human Geography*, 38(1), 118–130.
- Burchardt, H.-J., & Dietz, K. (2014). (Neo-)extractivism: A new challenge for development theory from Latin America. *Third World Quarterly*, 35(3), 468–486.
- Corvellec, H. (2016). Sustainability objects as performative definitions of sustainability: The case of food waste-based biogas and biofertilizers. *Journal of Material Culture*, 21(3), 383–401.
- De Gregori, T. R. (1987). Resources are not; They become: An institutional theory. *Journal of Economic Issues*, 21(3), 1241–1263.
- Dewulf, J., Hellweg, S., Pfister, S., León, M. F. G., Sonderegger, T., de Matos, C. T., ... Mathieux, F. (2021). Towards sustainable resource management: Identification and quantification of human actions that compromise the accessibility of metal resources. *Resources, Conservation and Recycling*, 167, 105403.
- Erdoğan, S., Çakar, N. D., Ulucak, R., Danish, & Kassouri, Y. (2021). The role of natural resources abundance and dependence in achieving environmental sustainability: Evidence from resource-based economies. *Sustainable Development*, 29(1), 143–154.
- Gómez-Baggethun, E., & Ruiz-Pérez, M. (2011). Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography: Earth and Environment*, 35(5), 613–628.
- Hart, S. L. (1995). A natural-resource-based view of the firm. *The Academy of Management Review*, 20(4), 986–1014.
- Hayter, R., & Patchell, J. (2015). Resource geography. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (Second ed., pp. 568–575). Oxford, England: Elsevier.
- Hickel, J. (2019). The contradiction of the sustainable development goals: Growth versus ecology on a finite planet. *Sustainable Development*, 27(5), 873–884.
- Huber, M. (2016). Resource geographies I: Valuing nature (or not). *Progress in Human Geography*, 42(1), 148–159.
- Huber, M. (2018). Resource geography II: What makes resources political? *Progress in Human Geography*, 43(3), 553–564.
- Hultman, J., Corvellec, H., Jerneck, A., Ekroos, J., Gustafsson, C., Nilsson, F. L., ... Arvidsson, S. (2021). A resourcification manifesto: Understanding the social process of resources becoming resources. *Research Policy*, 50(9), 104297.
- Imran, S., Alam, K., & Beaumont, N. (2014). Reinterpreting the definition of sustainable development for a more ecocentric reorientation. *Sustainable Development*, 22(2), 134–144.
- Iqbal, Q., & Ahmad, N. H. (2021). Sustainable development: The colors of sustainable leadership in learning organization. *Sustainable Development*, 29(1), 108–119.
- Jostad, P. M., McAvoy, L. H., & McDonald, D. (1996). Native American land ethics: Implications for natural resource management. *Society & Natural Resources*, 9(6), 565–581.
- Koch, N., & Perreault, T. (2019). Resource nationalism. *Progress in Human Geography*, 43(4), 611–631.
- Lohani, S. P., Keitsch, M., Shakya, S., & Fulford, D. (2021). Waste to energy in Kathmandu Nepal: A way toward achieving sustainable development goals. *Sustainable Development*. <https://doi.org/10.1002/sd.2183>.
- Lowery, B., Dagevos, J., Chuenpagdee, R., & Vodden, K. (2020). Storytelling for sustainable development in rural communities: An alternative approach. *Sustainable Development*, 28(6), 1813–1826.
- Luke, T. W. (1995). On environmentality: Geo-power and eco-knowledge in the discourses of contemporary environmentalism. *Cultural Critique, Part II*(Autumn), 57–81. <https://doi.org/10.2307/1354445>
- Luke, T. W. (2001). Reconstructing nature: How the new informatics are rewriting the environment and society as bitspace. *Capitalism Nature Socialism*, 12(3), 3–27.
- Luke, T. W. (2002). The practices of adaptive and collaborative environmental management: A critique. *Capitalism Nature Socialism*, 13(4), 1–22.
- Luke, T. W. (2005). Neither sustainable nor development: Reconsidering sustainability in development. *Sustainable Development*, 13(4), 228–238.
- Luukkanen, J., Kaivo-oja, J., Vähäkari, N., O'Mahony, T., Korkeakoski, M., Panula-Ontto, J., ... Quoc, A. N. (2019). Resource efficiency and green economic sustainability transition evaluation of green growth productivity gap and governance challenges in Cambodia. *Sustainable Development*, 27(3), 312–320.
- Martinez-Alier, J. (2018). Ecological distribution conflicts and the vocabulary of environmental justice. In V. Dayal, A. Duraipappah, & N. Nawn (Eds.), *Ecology, economy and society: Essays in honour of Kanchan Chopra* (pp. 187–204). Springer: Singapore.
- Moore, J. W. (2016). The rise of cheap nature. In J. W. Moore (Ed.), *Anthropocene or capitalocene? Nature, history, and the crisis of capitalism* (pp. 78–115). Oakland, CA: PM Press.
- Moya-Clemente, I., Ribes-Giner, G., & Pantoja-Díaz, O. (2020). Configurations of sustainable development goals that promote sustainable entrepreneurship over time. *Sustainable Development*, 28(4), 572–584.
- Næss, A. (1989). *Ecology, community and lifestyle: Outline of an ecosophy*. Cambridge, England: Cambridge University Press.

- Nhamo, G., Muchuru, S., & Nhamo, S. (2018). Women's needs in new global sustainable development policy agendas. *Sustainable Development*, 26(6), 544–552.
- Ramos, T. B., Caeiro, S., Moreno Pires, S., & Videira, N. (2018). How are new sustainable development approaches responding to societal challenges? *Sustainable Development*, 26(2), 117–121.
- Richardson, T., & Weszkalnys, G. (2014). Introduction: Resource materialities. *Anthropological Quarterly*, 87(1), 5–30.
- Rockstrom, J., Steffen, W., Noone, K., Persson, Å., Stuart Chapin, F., III, Lambin, E. F., ... Foley, J. A. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472–475.
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4–6), 827–838.
- Scheyvens, R., Banks, G., & Hughes, E. (2016). The private sector and the SDGs: The need to move beyond 'business as usual'. *Sustainable Development*, 24(6), 371–382.
- Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. New Haven, CT: Yale University Press.
- Silvertown, J. (2015). Have ecosystem services been oversold? *Trends in Ecology & Evolution*, 30(11), 641–648.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 736–746.
- The European Parliament and the Council of the European Union (2008/98/EC) Directive 2008/98/EC of the European Parliament and the Council on waste and repealing certain documents. *Official Journal of the European Union* L 312/3, 0003–0030.
- Tian, X., Gao, W., Liu, Y., & Xu, M. (2020). Secondary resource curse's formation and transmission mechanism based on environmental external-ity theory. *Resources, Conservation and Recycling*, 161, 104958.
- Tremblay, D., Fortier, F., Boucher, J.-F., Riffon, O., & Villeneuve, C. (2020). Sustainable development goal interactions: An analysis based on the five pillars of the 2030 agenda. *Sustainable Development*, 28(6), 1584–1596.
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development (A/RES/70/1)*. New York, NY: United Nations.
- Walsh, Z., Böhme, J., & Wamsler, C. (2021). Towards a relational paradigm in sustainability research, practice, and education. *Ambio*, 50(1), 74–84.
- Whitehead AN, Griffin DR and Sherburne DW (1978 [1929]) Process and reality: An essay in cosmology.
- Winterstetter, A., Heuss-Assbichler, S., Stegemann, J., Kral, U., Wäger, P., Osmani, M., & Rechberger, H. (2021). The role of anthropogenic resource classification in supporting the transition to a circular economy. *Journal of Cleaner Production*, 297, 126753.
- Zafar, M. W., Saeed, A., Zaidi, S. A. H., & Waheed, A. (2021). The linkages among natural resources, renewable energy consumption, and environmental quality: A path toward sustainable developments. *Sustainable Development*, 29(2), 353–362.
- Zimmermann, E. W. (1951 [1933]). *World resources and industries: A functional appraisal of the availability of agricultural and industrial resources*. New York, NY: Harper & Brothers.

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